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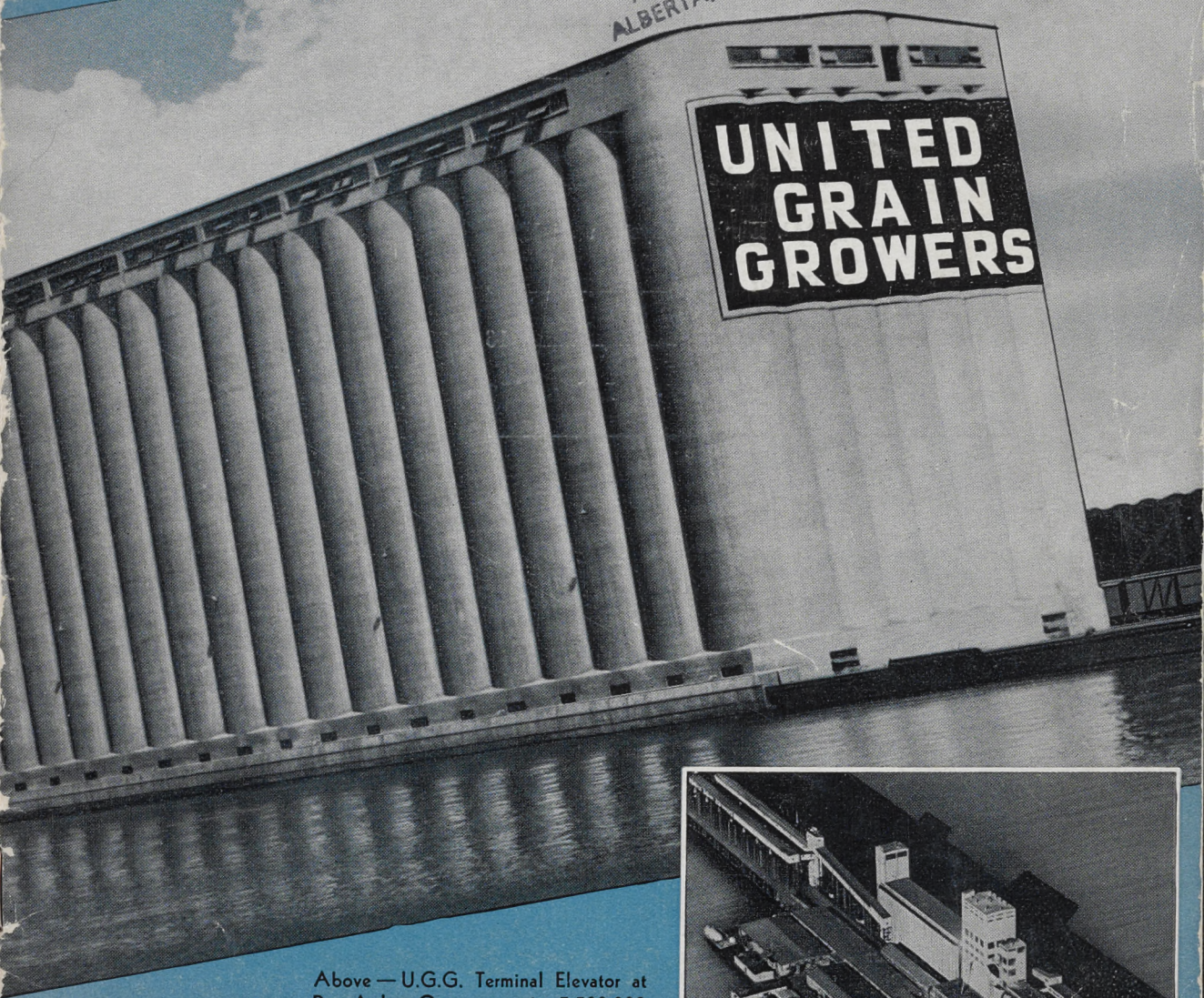
# WHEAT STUDY FOR JUNIORS

JUN 5 1990

Agriculture is Canada's most important single industry, providing as it does a livelihood for some 3,000,000 people . . . about 25% of our population.

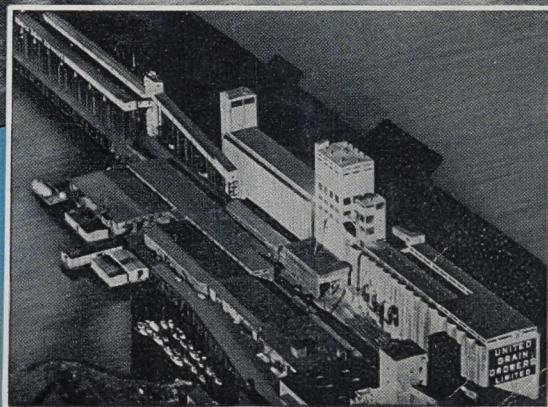
This pamphlet has been prepared by United Grain Growers Limited to assist young students, particularly those in grades 7 to 10, in their studies of grain.

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Above — U.G.G. Terminal Elevator at Port Arthur, Ont., — capacity 5,500,000 bushels.

At right — View from air of Terminal Elevator at Vancouver, B.C., — capacity 2,600,000 bushels.





# A Wheat Study for Juniors

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*A golden river of golden grain travels along the automatic Terminal conveyor.*

## **A Wheat Study for Juniors**

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*"Give us this day our daily bread" . . . In different forms and in different lands, by every race and creed, this has ever been the prayer of the countless humans who have inhabited the earth. Today, to increasing millions of people bread is indeed the "staff of life" and to them . . . bread means wheat!*

It is natural that people who eat bread should desire to know more about the origin and history of the cereal that sustains them. The growing of wheat goes far back into prehistoric times . . . its exact origin, however, has never been clearly established.

The earliest evidence of agriculture is found in Europe some twelve thousand years ago during a phase of human affairs, commonly referred to as the "Stone Age." In an early period of the "Stone Age," man first began to use implements and weapons made of stone. He also learned to domesticate animals, to develop the art of pottery, weaving and cooking and to engage in a form of agriculture using plants and seeds. The people of that era are thought to have travelled to Europe from a land lying to the south and south-east. Perhaps it was from a region now submerged by either the Indian Ocean or the Mediterranean Sea, for the contours of the ancient continents differed vastly at that time from those we know today. Wanderers by instinct, migrating with changes of climate and in search of food, people of the "Stone Age" did not at first stay with their primitive agriculture. Only at times did they harvest the crops they had planted, preferring it seemed, the roaming existence of the hunter. Later they settled in

tribal groups and entered a form of community life. Thus developed the first form of civilization. Indeed it was the appearance of agriculture that tended to tie communities of mankind together. This was possible because food could be provided to a large number of people by a relatively smaller group, permitting men to engage in endeavors other than the constant search for food supplies. Without the knowledge of cultivating cereal crops and of storing them for later use, not one of the world's great cities, not even a town of one thousand people could have come into existence.

In tracing the history of the ages through periods and stages of development, Mr. H. G. Wells, in his "Outline of History" says of the "Stone Age" people—"Of their agricultural methods we know very little. No plows and no hoes have been found. They were of wood and perished. They cultivated and ate wheat, barley and millet, but they knew nothing of rye. Their grain they roasted, ground between stones and stored in pots to be eaten when needed. They made exceedingly solid and heavy bread, because round flat slabs of it have been found in deposits in the lake districts of Switzerland. These were discovered when in the very dry winter of 1854, the water level sank to an unheard of lowness, revealing the foundations of prehistoric pile dwellings of the Neolithic (Stone) Age. One sort of barley that they had is the type that was cultivated by the ancient Greeks, Romans and Egyptians. They also had an Egyptian variety of wheat, showing that their ancestors had brought or derived this cultivation from the south-east. The centre of diffusion of wheat was somewhere in the Eastern Mediterranean region."

When the Lake Dwellers sowed their little patches of wheat in Switzerland, they were already following the immemorial practice of mankind. The seed must have been brought age by age from some distant region in the East where man had been growing wheat for some hundreds, perhaps thousands of years.

Excavations indicate that an early agricultural stage was reached even before the invention of writing; crops being reaped by sickles made of earthenware.

Wheat has been found in Egyptian tombs, estimated to be 6,000 years old. The hulls of this wheat clearly indicate that it was threshed by a special type of mill. Egyptian or "Mummy" wheat has been offered to modern farmers at fabulous prices, but careful test demonstrates conclusively that real "Mummy" wheat will not germinate, having entirely lost its reproductive power. The Chinese considered wheat a gift from Heaven and are known to have used it as a food 5,000 years ago. The traditional Chinese social system recognized four main classes. Second in standing of these groups were the "cultivators of the land," ranking above the artisans and mercantile class.

Dr. A. R. H. Buller in his "Essays on Wheat," recounts an interesting story of the origin of wheat as given in Greek mythology. The Goddess Demeter, learning that her daughter Persephone had been carried off by Hades, became so enraged she made the earth barren, threatening its inhabitants with famine. On finding Persephone, and as a grateful token of her treatment on earth, where she searched so long for her daughter, Demeter bestowed on mankind the gift of wheat, sending a messenger round the world to spread the knowledge of agriculture. Temples were raised to Demeter who was henceforth regarded as the Greek Goddess of Agriculture. In 496 B.C., a severe drought was experienced by the Romans and they called on Demeter to help them. The parched crops survived and the cult of Demeter spread throughout Italy, the name of Demeter being changed by the Romans to Ceres. Today a variety of high quality spring wheat is called Ceres, after the ancient Goddess of Agriculture. The Romans greatly extended agricultural practices by developing new varieties of wheat which could be grown successfully in distant parts of the Roman Empire. Strict





*The grain sampler at work.*

## A WHEAT STUDY FOR JUNIORS

control was exercised by the Roman State which distributed seed, determined the quantity to be sown and marketed the harvested crops.

The manner in which wheat spread throughout the world is as obscure as is the mystery of its origin. Few, however, are the areas of the earth's surface where wheat is not cultivated. Apart from the Arctic regions and the wastelands of the great deserts, wheat is grown in almost every country of the world. Its production is recorded in regions of the Dead Sea, which lies 1,292 feet below sea-level in the Jordan Valley. It is cultivated in the highest mountain ranges, the record being in Tibet, where it is grown 15,000 feet above sea-level.

### THE WILD WHEAT OF PALESTINE

The search for the primitive wheat specie has continued down through the ages but only in the present century have we learned something about it.

In 1904, Aaron Arnonsohn, Director of the Jewish Experimental Station at Haifa, Palestine, was prompted to search for wild wheat in the locality of Mount Hermon, near Upper Galilee. Failing in his first attempt he returned in 1906 to renew his search, and this time his effort was successful. On his way to Mount Hermon, while walking in a vineyard at Rosh Pinar, he suddenly noticed an isolated plant growing in a rock crevice. At first it looked like barley, but on closer inspection it proved to be the long sought, and what is now known as, the "Wild Wheat of Palestine." Arnonsohn was elated, for although he found but a single plant, it was a fine specimen. Later in the same vicinity, he found wild wheat growing in abundance. Here at last was the original type . . . the ancestral parent of all modern wheat varieties. Samples of "Palestine" wheat have since been grown at Bard, California, and certain types of "Wild Wheat" are reported to have been grown experimentally in Western Canada. "Palestine" wheat closely resembles certain types of grasses, from which all cereal grains have developed. It bears drooping, long-bearded heads and the stem is very brittle.

### GROWTH OF THE WHEAT PLANT

All living things possess a certain power of growth. They require nourishment and are able to move about as they feed and grow. The movement may be very slight. Perhaps no more than the spread of roots in the ground or branches in the air. They reproduce their own kind by means of seeds, spores, eggs or other ways of creating life. There is great similarity in the methods of reproduction of animal life and plant life. Each continually strives to reproduce and to preserve its own life. This is the way of all living things.

Unlike most plants which are incapable of reproducing by themselves, wheat, like other cereal grains, is self-fertilizing. The flowers have both male and female cells, called the stamen and the pistil. The stamen has two tiny pollen sacks which overhang the pistil in the centre of the flower. Fertilization generally occurs on a warm summer morning. The stamen of the little flowers suddenly projects bursting the pollen sacks, allowing the pollen to fall on the pistil of the same flower. Thus the germ of a new grain is created, which in time will go through the same process of self-reproduction.

Shedding of the pollen lasts only a few minutes but the procedure is repeated over a four-day period to ensure that all the flowers are pollinated. Natural crossing as a result of the wind carrying pollen from one plant to another is quite possible. In a like manner, crossings can be aided by insects who frequently act as pollen carriers. The wheat flower being capable of self-reproduction, does not need to attract bees or insects to carry pollen, hence it has neither perfume nor honey.



When wheat is seeded the tiny grains immediately start the involved process of reproduction. Growth begins with the seedling plant sending roots into the ground to find water and minerals necessary for growth while the stems shoot upward to absorb plant food in the form of carbon dioxide, from the air. Each plant sends up a number of stems and each in turn develops its own root. This expansion of the plant is called stooling. Once the root system is firmly established the rate of growth depends on weather conditions. One of the most critical periods of growth in the life of the wheat plant is the flowering stage, a period that lasts about ten to fourteen days. This is the time when evaporation of water from the leaves of the plant takes place at a very high rate, forcing the root system to make greater effort in providing water for the plant. Moisture of course must be present at some level of the soil and the roots must stretch out for it.

As growth progresses, the heads containing the new grains are formed. The kernels pass from the white paste or "milk stage" through the "dough stage" and as the dough loses moisture, the kernels harden and ripen. The grain is then ready for harvest.

In the growing period the wheat plant sends into the ground a mass of fibrous roots to a depth of from four to six feet. But moisture in the ground must extend to a depth of three feet to give an abundant crop, and this must be followed by timely rainfall. A two foot depth of moisture would assure only a meagre crop while any lesser amount would require very heavy rainfall to produce a worthwhile harvest. The volume of water needed to produce a wheat crop is truly startling. It has been estimated from official experiments that, under varying conditions, the production of a pound of wheat requires from 1,000 to 2,600 pounds of water .

### WHEAT AND CIVILIZATION

At this point it will pay us well to take a backward glance at world history and the part wheat has played in its development. Many of us may shudder when the word "history" is mentioned but on closer scrutiny we may find that what sometimes appears to be a dull subject becomes real and living to us. Every event which occurs, no matter how insignificant it may seem, is a part of history.

We find, on closer study, that much of our white civilization of today would have been impossible without the cultivation of wheat. It is not strange therefore, that some of our earliest records of trade between nations has to do with wheat. The reader will recall how Joseph went into Egypt and under Divine guidance, stored up the wheat crop of the seven bountiful years as a safeguard against the seven years of famine. Not only was this civilization of the Nile dependent upon wheat, but likewise the civilizations of the Tigris and Euphrates.

One of our earliest records of trade between nations was that of the commerce in wheat between King Solomon and Hiram, King of Tyre, nearly four thousand years ago. Today, wheat is still one of the most important food items entering into international trade.

It is interesting to note how the wheat production areas have changed with the decay of the old civilizations and the development of the new. From the Euphrates and the Nile the progress of civilization shifted to the Mediterranean Area. Here, we find Grecian ships sailing into the Black Sea to obtain wheat from what is now part of the U.S.S.R., at least five hundred years before the Christian era. A few hundred years later we find the centre of commerce and civilization in the Roman Empire, with the source of the wheat supply, in the British Isles.

Over a thousand years pass away and we find the British Isles the centre of development in industry and government. The country which once supplied the

Roman legions with their bread has become the greatest importer of wheat in the world. Most of this wheat comes from the New World and is eventually of great significance to the development of Canada as a nation.

Why has Canada become one of the world's greatest producers of wheat? Three factors have been important; cheap land, a large population using wheat as a staple food, and transportation to get the product from the producer to the consumer. Canada has always had plenty of the first of these. To understand the second we must go back to the England of the seventeenth century. The industrial revolution was reaching its peak and England was rapidly becoming the manufacturing centre of the world. This implied a rapidly growing population and since England could produce only a small part of her own food much had to be imported.

In the years following, land lay ready for the plow in North America and the population in England needed food, but this in itself was not enough. Indeed, there were those in England who predicted that part of the population must eventually starve and die. The last of our important factors—transportation—needs yet to be considered. This was well on its way to being solved when James Watt invented the steam engine.

It was then but a short step to the steam locomotive and the steamship. Of course wheat was carried from the New World to the Old by sailing ship but this was hazardous and only small quantities could be carried. The development of the iron ship struck the final blow to the old methods of transportation by water. After the railroad came to America it was only a short time before Canada started on a period of railroad building. All was ready for the development of the immense plains of Western Canada and the building of the wheat industry.

### INTRODUCTION OF WHEAT TO CANADA

Wheat was introduced into Western Canada by the Selkirk Settlers in 1812, when Lord Selkirk obtained 116,000 square miles of land from the Hudson's Bay Company and sent his band of pioneers out from Scotland to found a new colony for his evicted crofters. Winter wheat was seeded in the fall of 1812 when the advance party, led by Miles Macdonell, arrived at the junction of the Red and Assiniboine Rivers on August 30. Spring wheat was seeded early in 1813. The first two crops were total failures due to the settlers' lack of knowledge and inadequate equipment. So anxious was Lord Selkirk to encourage agriculture however, in 1815 he offered a prize of £50 to the settler who raised the largest quantity of wheat. Inspired by this offer, efforts were intensified and this time rewarded, the first wheat being harvested in Western Canada in 1815.

During their first years, the Selkirk pioneers, known as the Red River settlers, had more than Nature to contend with. The North-West Trading Company, a company of fur traders, frequently clashed with its great rival, the Hudson's Bay Company. The former resented the establishment of settled communities, believing the development of settlements might eventually destroy the fur trade. During these clashes of rival companies, crops were trampled, and in some cases totally destroyed. In addition, passenger pigeons heavily damaged the sparse crops, and on the whole agriculture made very little progress. A final catastrophe occurred in 1819 when a plague of grasshopper struck, leaving the colonists without any wheat for seed. A pioneer witness records: "Just as the crop was in head, a cloud of grasshoppers darkened the sky and fell like a heavy snow upon a devoted colony. Everything green perished!" Wheat production the following year was made possible by a party of settlers who made a winter journey on snow shoes to Prairie du Chien, Wisconsin, where they arranged the purchase of two hundred and fifty bushels of seed. Shipped by flatboats the precious seed arrived via the Red River just in time to be sown in the late spring of 1820.





*The chemist at work testing the world's finest wheat.*

The colony made rapid progress in the thirty years that followed. A census taken in 1849 showed the population to be 5,391 persons, and a survey at the same time showed about 6,000 acres of land under cultivation. Despite periodic setbacks development continued. Then in 1868, the grasshoppers struck again, destroying every vestige of crop. Again seed wheat was obtained from the United States; this time from St. Paul, Minnesota. Steady progress was made from that time on and although the peak of expansion was still a long way distant, international attention was centred on Canada in 1876, when an unidentified variety of wheat, grown at Fort Vermilion on the Peace River won the world championship at Philadelphia. Here indeed was proof of the progress made in half a century.

#### **ORIGIN OF RED FIFE**

Canada's world-famed reputation as a grain producing country was built on two varieties of wheat. First on Red Fife named after David Fife a farmer of Otonabee, Ontario, which became the standard in the west in the early eighties of the last century and subsequently on Marquis, which will be dealt with later. The tremendous export volume of today had its beginning in 1876 when the first consignment of Red Fife was shipped from Winnipeg to the R.C. Steele Company, seed merchants in Toronto. The amount shipped was 857 bushels for which the growers received 85 cents a bushel. The following year the first shipment was made to British millers who since that time have become Canada's most important customers.

There has always been some doubt of the manner in which Red Fife was introduced into Western Canada. Perhaps it came with new settlers from Ontario. Again it may have formed part of the seed shipped from the United States in 1869 and there is some evidence to support this possibility. We know more however, of the part played by David Fife in developing the variety which was later to bear his name. Although there are several versions of the story, the late Dr. E. Cora Hind, a foremost authority relates: "Facts early established are that David Fife about 1842 had sent to a friend in Glasgow for some good seed wheat, expressing a preference for one of the Russian wheats. The friend sent the wheat from a cargo just arrived from Danzig, a Baltic port, but failed to say whether it was spring or winter wheat and only one plant with three heads matured. These Fife saved as they were attractive, and evidently spring wheat. They were seeded in a sheltered spot next spring, did well, were duly harvested and from that small beginning sprang all the Red Fife wheat which later was to make Canada famous." Tradition also has it that David Fife's wife contributed to Canada's future destiny by rescuing the single plant from the family cow after it had consumed all but the three heads which were later used for seed.

Man breeds wheat and many other plants just as he breeds cattle, and in doing so he seeks to introduce and to establish the qualities he values. This can be done in two ways; by simple selection or by combined selection and crossing. In simple selection, a head is chosen which appears to be of a superior type and the grains from this head are planted. On maturity, the best heads are again selected and planted. This selection and planting continues until definite superiority is established. David Fife undoubtedly followed this procedure in developing Red Fife wheat.

The scientific plant breeder however does not leave crossings to chance. With great care he transfers the pollen of one variety to the pistils of another, covering the head with gauze or paper sacks to prevent the pollen of other plants from getting to the pistil of the plant used in the crossing. Results vary, some heads resemble one parent—some the other. Sometimes neither parent is resembled much to the annoyance of the plant breeder, whose work is delayed when this happens. Crossings are continued in this manner and slowly strains are improved and new varieties developed. Plant scientists have greatly contributed to agriculture since the turn of the present century. The role of David Fife however, will long be remembered and it was an indirect tribute to him when in 1932, the Canadian Seed Growers' Association erected a cairn in Winnipeg, marking the exact spot where farmers delivered the first Red Fife wheat for shipment to Toronto.

### THE DISCOVERY OF MARQUIS

The outstanding name among the many contributors to Canadian agriculture is that of Dr. Charles E. Saunders. It was Dr. Saunders who, as Canada's first Dominion Cerealists, gave to Canadian farmers Marquis wheat, a variety which for years had no rival. The millions of bushels of Marquis that have been shipped to the four corners of the world, all originated from a single head of wheat planted by Dr. Saunders in 1903. While newer wheat varieties may today be better suited to certain areas because of climate and soil conditions, the discovery of Marquis was undoubtedly one of Canada's greatest agricultural triumphs.

Although three experimental farms had been established before 1850, the first by Lord Selkirk, each of these had failed. In 1886, Dr. William Saunders was appointed to organize and direct the work of Dominion Experimental farms for the Government. He had conceived the idea of improving plants by breeding, and to assist him Dr. Saunders employed his two sons, Charles E. Saunders and



A. P. Saunders. Red Fife wheat, which at this time had proved the basis of large-scale production, while highly productive and possessing excellent milling and baking qualities, had one bad fault. It was late in ripening which made it susceptible to damage by early frosts and farmers were crying for an earlier maturing variety. Dr. Saunders with his two sons lost no time in seeking an answer to the frost hazard. Varieties from foreign countries were imported and grown at various experimental farms from which it was found that the earliest maturing wheats came from Russia and India. These unfortunately were inferior to Red Fife in milling and baking quality. Ladoga, a hard Russian wheat, gave encouraging results on early experiment, but the tests of the first carlot shipped proved most disappointing. The flour lacked strength and produced a yellow-colored bread of coarse texture. Not discouraged by initial failure however, the work went steadily on until thousands of crosses had been made and new strains produced.

In 1903 Dr. Charles E. Saunders was appointed by the Government to a newly created position as Dominion Cerealist and was authorized to confine his attention to plant breeding. Thus he inherited the mass of material which resulted from the research of both his father and brother. He particularly liked one of the strains which had been produced from a crossing made by his brother. The male parent of this attractive type was Red Fife and the female parent, an early ripening Indian wheat known as Hard Red Calcutta. As Hard Red Calcutta is a trade name covering a mixture of different varieties, there must always be doubt as to the specific strain which served as the female parent of this promising type. Selecting a single head, Dr. Saunders in 1903 started reproduction of his new strain and in 1906 had a sufficient quantity to provide exhaustive milling tests. The results were excellent, and, as the new wheat matured from six to ten days earlier than Red Fife, the answer to the demand for an early wheat had been found. Dr. Saunders named his new variety Marquis. It spread throughout Western Canada and in 1928 Marquis occupied between 80 and 90 per cent of the entire spring wheat area. Canadian farmers have literally reaped millions of dollars from their production of Marquis and its splendid milling and blending qualities have greatly enhanced Canada's reputation with importing countries throughout the world.

The discovery of Marquis revealed the possibilities of further plant breeding and down through the years steady progress has been made in improving varieties. Types most suitable for certain soil conditions, or that which will resist such diseases as smut, the blight of rust, insect damage and various hazards that continually confront the farmer, is the constant objective of the plant breeder. Among the important varieties to benefit the prairie wheat grower in recent years are Reward, Thatcher, Saunders, Redman, etc. The most recent triumph is credited to Mr. A. W. Platt of the Swift Current Experimental Station, for his development of Rescue wheat, a sawfly-resistant variety. If Rescue lives up to its advance claims it may easily save farmers hundreds of thousands of dollars annually. Marquis, however, continues to be the standard of quality despite the numerous excellent wheats which have been made available to farmers.

In 1948 the Board of Grain Commissioners served notice to growers that commencing with the 1951 crop Red Bobs, a very popular variety, particularly in Alberta, would not be permitted in grades higher than Three Manitoba Northern. The reason given for this action was that exhaustive tests over a number of years proved that Red Bobs was no longer equal to Marquis, particularly in its blending value with softer wheats. It is expected that Red Bobs will be replaced to a great extent by Saunders, a variety which has given much promise at the Central Experimental Station in Ottawa, where it was developed.

## GRAIN ACT AND BOARD OF GRAIN COMMISSIONERS

The rapid expansion of wheat production in Western Canada soon necessitated the building of elevators and the development of other facilities to handle the increasingly large crops. Foreseeing large profits resulting from such an investment, the first elevators were built by private grain companies. To provide a meeting place for the buying and selling of grain, the Winnipeg Grain Exchange, soon to rank as a world trading centre, was organized in 1891.

With the building of elevators, abuses soon crept into the handling of grain. Farmers, entirely at the mercy of the elevator companies for grade, weight and dockage, voiced strong complaints which led to a Government inquiry and to the later passing of the "Manitoba Grain Act" in 1900. In 1912 the Canada Grain Act superseded the Manitoba Act and provided more rigid control of the grain industry with added protection for the farmer. One of the immediate advantages to the farmer resulting from the new Grain Act, came with the appointment of a Board of Grain Commissioners to administer regulations applying to the grading and weighing of grain, distribution of railway cars and various phases of grain handling, including the licensing and bonding of grain dealers.

The Board of Grain Commissioners which has complete supervision of the marketing of all Canadian grain, consists of a Chief Commissioner and two Commissioners at Winnipeg, with an Assistant Commissioner located in each of the prairie provinces. Farmers claiming unfair treatment by elevator companies can seek redress of their grievance through the Board and one of the duties of the Assistant Commissioners is to investigate such complaints. The Board also maintains a Research Division to provide technical services and information necessary in administering the Canada Grain Act. Each year the Board's laboratory conducts thousands of tests to establish the milling and baking quality and other characteristics of the new crop.

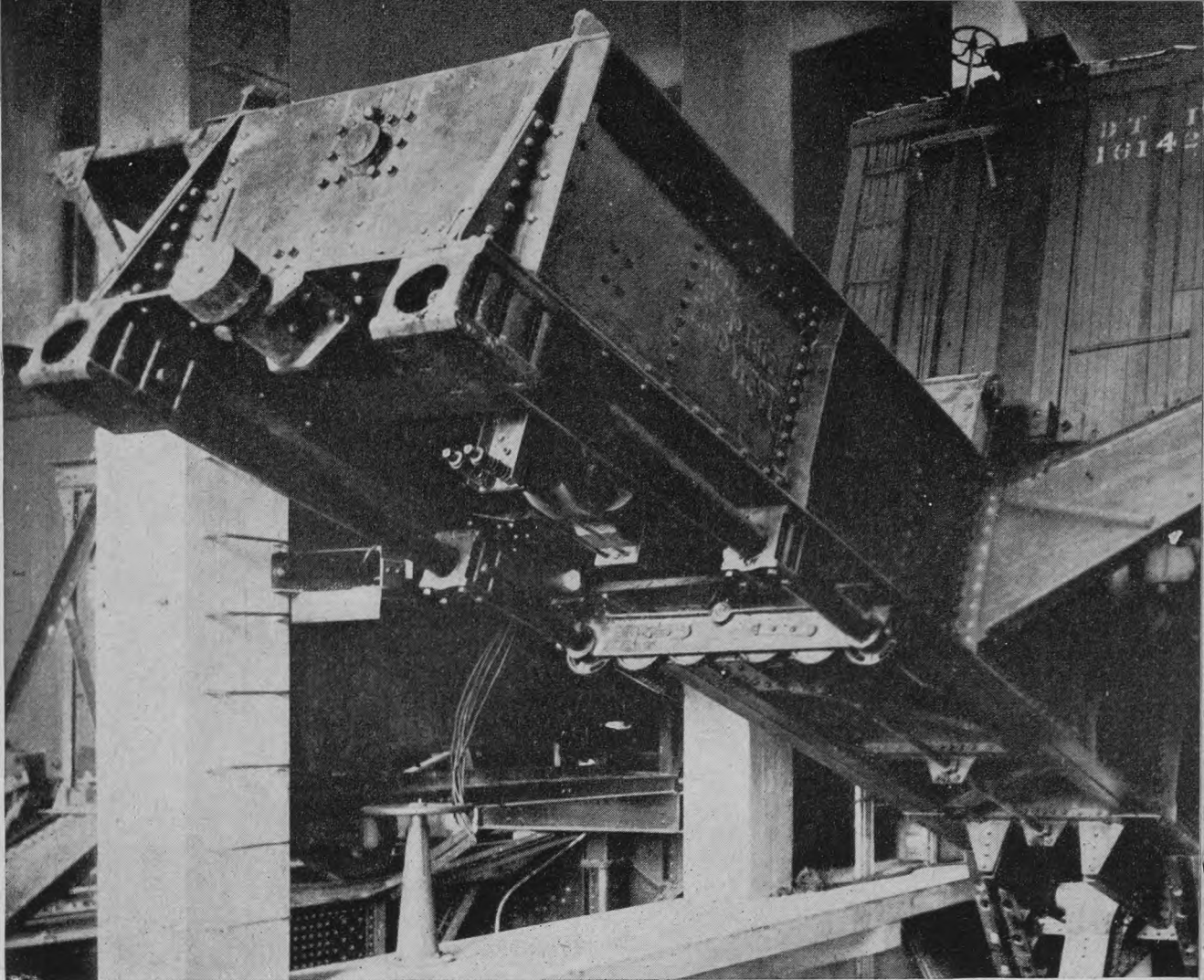
## FARM PROBLEMS AND MARKETING

The first question each farmer must decide is the kind of grain most suitable for his particular locality. He must consider such factors as soil structure, average rainfall, the danger of frost and hail damage and whether it will pay him a higher return to feed his threshed grain to livestock instead of marketing it directly. Having decided the kind of grain to be grown, the next important question is the selection of a suitable variety. Here again local conditions must be carefully studied.

The best varieties may not be suitable for his soil or location and he will likely be guided by other farmers in his district. In Northern areas, varieties which mature quickly will likely be preferred. In rust areas, rust resistant grains will have a strong appeal, while insect resistant varieties will be popular in districts which anticipate damage from the sawfly and other insects. These and many other questions must be determined in planning a farm program.

Having produced a crop it must be marketed. Under present conditions two different systems are operated to market the Canadian crop. There is first the system operated by the Dominion Government through which the Canadian Wheat Board controls the marketing of all wheat. The second is the open market method under which at the present time, all coarse grains (oats, rye, barley, etc.) are sold on a competitive basis. The open market system originated with the development of the Winnipeg Grain Exchange and was the accepted method of selling all grain until 1943, when emergency conditions arising from the second world war, forced the Government to suspend wheat trading.





*"Up she goes"—Unloading the grain car.*

The first departure from competitive trading on the open market occurred during the first world war, when the Dominion Government purchased wheat from producers at a set price. In 1919, although the war had ended, abnormal conditions still prevailed and the first Canadian Wheat Board was appointed to handle the crop of that year. Trading on the Winnipeg Grain Exchange, which had been suspended during this period, was resumed in 1920. In 1929-30 collapse of world markets again forced the Dominion Government to enter the grain business; this time to direct the sale of large wheat stocks accumulated by the selling agency of the Western Wheat Pools. It was from the situation which developed in the early thirties that the Canadian Wheat Board (it has no connection with the Wheat Pools) in its present form, was created in 1935. Authority of the Wheat Board in its early operation was greatly limited compared with its present power of control. Indeed until 1943, when war conditions made the suspension of wheat trading essential, the Wheat Board system and the open market system of marketing functioned side by side.

The chief difference in the two methods of selling may be summed up in the following manner. Under the Wheat Board system the farmer is assured of a fixed minimum price for his wheat. Those who support this type of marketing make this their chief argument, claiming that the farmer does not suffer loss through the



# UNITED GRAIN

AND ADDITIONAL SERVICES

KEY TO MAP

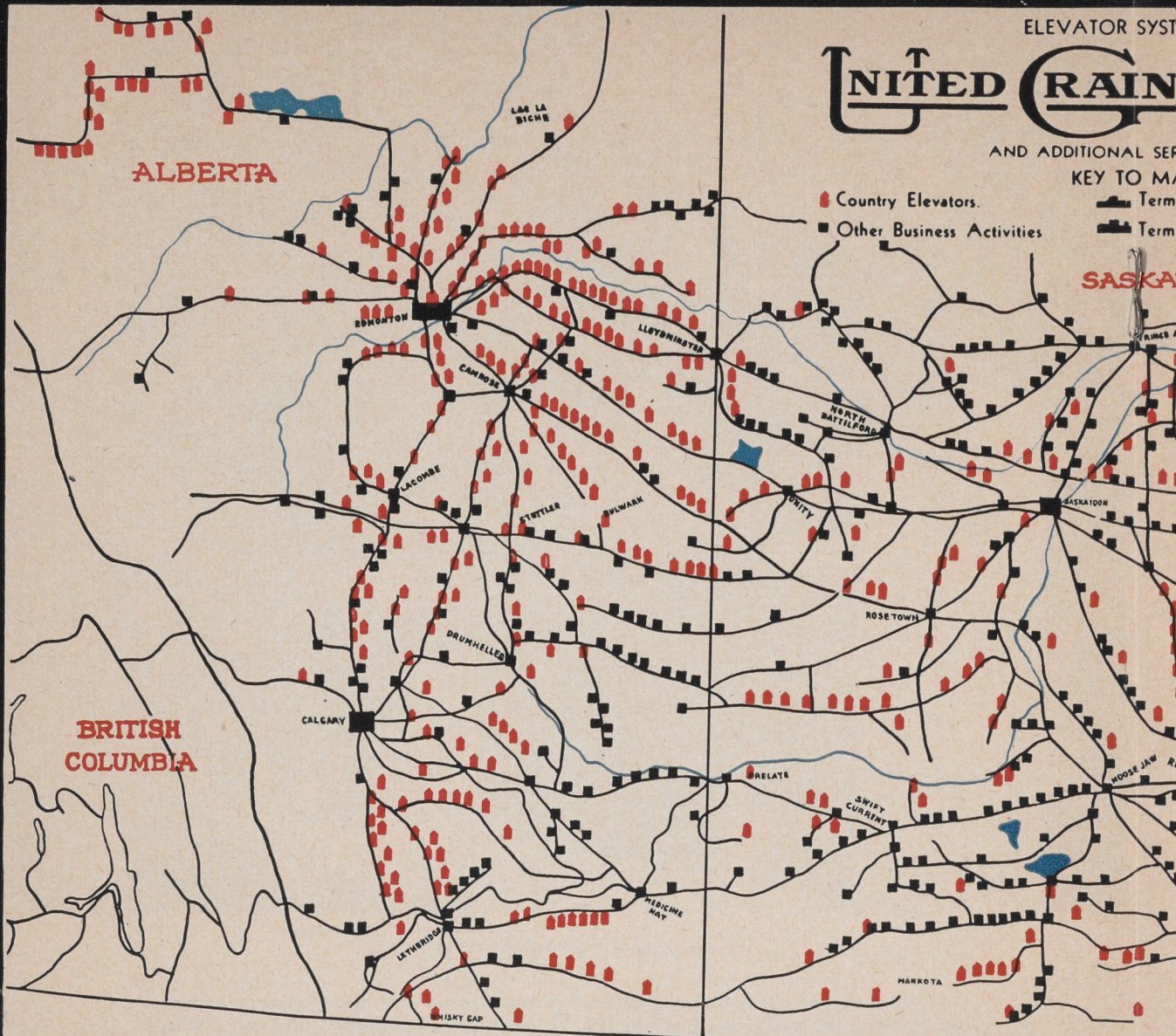
Country Elevators.

Other Business Activities

Terminals

Terminals

SASKATCHEWAN



(Read also "The Story of United Grain

The elevator system of United Grain Growers Limited is widespread throughout Western Canada, just as the ownership and control of the Company is widespread among prairie farmers.

There are at present 628 United Grain Growers' country elevators: 114 in Manitoba, 206 in Saskatchewan, and 306 in Alberta, with 2 additional elevators just over the border in British Columbia. The map above shows hundreds of additional points where the services of the Company are made available to farmers in

the distribution of supplies and in the issue of insurance policies.

Grain collected through these hundreds of country elevators flows to market by either the eastern or the western route, through the Company's terminals at Port Arthur or Vancouver.

There are 40,000 farmer shareholders, most of whom own both a Membership Share, par value



# AIN CROWERS LIMITED

NAL SERVICE POINTS

TO MAP

Terminal Elevator at Port Arthur, Ont

Terminal Elevator at Vancouver, B.C

SKATCHEWAN



Grain Growers Limited, pages 19-24)

\$5.00 each, entitling them to vote, and also one or more Class "A" Shares, the par value of which is \$20.00 each and which do not carry voting rights. Membership Shares are available to all customers and may be acquired only by customers. Continuing control of the Company by active farmers doing business with United Grain Growers Limited is thus assured.

Members are organized in approximately 300 locals, each of which elects one of the delegates who make up the annual meeting.

Shareholders have an equity in the Company of over \$6,000,000.00. Payments to shareholders and to customers have amounted to more than \$9,000,000.00

The ownership and control, the services rendered and the benefits derived by members and customers of the Company extend as widely throughout the West as this map indicates.





fluctuations in price. They argue that prices are usually lower in the fall, and because many farmers must sell their produce at that time of year they therefore, lose considerable money.

Under the Canada-United Kingdom Wheat Agreement the Canadian Wheat Board has sold wheat at prices higher than that paid initially to the farmers. Since part of the Canadian wheat crop is sold on a world, or competitive market in which prices fluctuate from day to day, the final selling price of Canadian wheat has not been known at the time it was purchased from the farmer. The fund accumulated from the sale of wheat in excess of the Wheat Board's initial payment, has been distributed to farmers from time to time on a bushel basis. Under such a policy producers have no way of knowing exactly what the final return will be.

Before the Wheat Board took over the complete handling of wheat, however, the country operated under a competitive system. The farmer was free to sell his wheat outright to whatever elevator company he chose. He knew from daily market quotations exactly what wheat of a particular grade would bring. If he considered the price too low he could hold his grain until prices improved. On the other hand, if he required money immediately, he accepted the prevailing competitive price. Once the sale was made the farmer had no more concern with his wheat, it was completely the property of the purchasing company.

As this pamphlet is written the Wheat Board continues to control the sale and export of all Canadian wheat and the Government has announced that commencing with the 1949-50 crop year the marketing of all oats and barley will also come under control of the Wheat Board. The limited production of flax and rye which alone will remain free of Wheat Board control, may make it virtually impossible for the Winnipeg Grain Exchange, which in the past has played such a vital part in marketing Canadian grain, to continue operation—its future at this time, is indeed uncertain.

Some country elevators are privately owned and like most companies which conduct a public business are operated for the profit of the shareholders. Other elevator organizations are co-operatives, owned by farmers and operated entirely for their benefit. When grain is delivered to an elevator its physical handling is the same under the open market and Wheat Board systems. If the farmer and the elevator operator cannot agree on the grade—and each grade has its own value, the farmer is not compelled to accept the operator's grade. The grain may be placed in a special bin and a sample sent to the Government inspector for his decision. The Government inspector notifies both parties the official grade of the grain and this decision is binding.

The selling of grain however is quite different. Under the open market system the farmer retains control of his grain as long as he is willing to pay the storage charge, after the expiration of 15 days free storage which he is given, which is one-twenty-fifth of one cent per bushel per day. If he thinks the price will advance he may hold his grain in storage until the price appeals to him. Prices fluctuate with varying conditions and are established by the buying and selling transactions which daily take place on the Winnipeg Grain Exchange. When grain is sold in the elevator the farmer receives a cash ticket in full settlement, less any storage charges which have accrued.

As has been mentioned previously, since 1943 all wheat must be sold through the Canadian Wheat Board which assumes control as soon as the grain is delivered to the elevator. The elevator operator issues a cash ticket which represents an initial payment on behalf of the Wheat Board. In addition the farmer receives a producers certificate which entitles him to further payments the Board may be



able to make as a result of its operations. The operation of the Grain Exchange and the selling policies of the Canadian Wheat Board, however, are subjects too involved and too intricate to deal with in this pamphlet and such information should be sought from other sources.

### THE GRADING OF WHEAT

Probably no other country in the world has so elaborate a system to protect its grain grading as Canada has developed and which is supervised by the Board of Grain Commissioners. Canadian grain is sold on the "government certificate final" which guarantees that the purchased grain will be equal to a specific standard of quality.

The Grain Act provides for certain statutory grades of grain and clearly defines the standard quality together with the amount of damage permitted in each grade. "Standard" samples, comprised of the new crop are established each year to guide the grain trade in their operations. These are also sent to the principal markets of the world for the guidance of importers. While appearance may differ slightly from year to year depending on growing conditions, the quality and milling value must conform to the "Statutory Grade" requirements as defined in the Grain Act. Hence a buyer of No. 1 Manitoba Northern is assured that his wheat will weigh a minimum of 60 pounds per bushel, will be of Marquis variety or a variety equal to Marquis, contain not less than 65 per cent of hard vitreous kernels, will be well matured and practically free from damaged kernels and foreign matter. In addition the baking properties (gluten strength, protein content, etc., factors essential in the milling of flour) of each "Standard" is determined by test at the Board's laboratory and the results published for the guidance of purchasers.

Australia, Argentina and India, export on a basis of "fair average quality" or F.A.Q. Under this system purchases are based on average samples of each new crop which are forwarded to the various world markets. These constitute the standard for the year and are bound to differ in quality from year to year due to the variation in growing conditions. Complaints under this system are settled by arbitration. Purchasers of Canadian grain, having bought on the basis of "Government certificates final" with an assured standard of quality regardless of growing conditions, very seldom have cause to complain against grain delivered. The Canadian system provides for the rapid handling of grain in large volume and on the whole works satisfactorily. Constant watch, however, is kept to safeguard the high reputation which Canada has earned in protecting alike the interest of both producer and purchaser.

Western wheat, other than local requirements, moves to export positions located mainly at Fort William and Port Arthur in the east and Vancouver in the west. At these, and at principal points on the prairies, Government inspection departments are located which inspect the grain as it moves to an export position. As a grain train arrives at an inspection point, the car seals are broken and an average sample is taken from each car. Samples are obtained by means of a long metal probe constructed so as to readily show the presence and location of any pockets of inferior grain or dockage (foreign matter, weed seeds, etc.). Sampling completed, cars are resealed and proceed to destination, the samples being rushed to the Inspection Office for grading. Qualified Government inspectors, after cleaning each sample, establish grade, dockage and moisture content and issue a certificate showing the particulars of each car inspected. In a busy season, cars inspected at Winnipeg will exceed 2,000 daily for weeks at a time. With only a car number to identify each sample, the inspector has no knowledge as to the

ownership of the car he is grading. The procedure of sampling and inspection is so highly organized that mistakes are almost impossible.

Advice of the grade assigned by the Government inspector is forwarded to the terminal prior to arrival of the trains to facilitate the unloading, cleaning and binning of each car into huge bins containing grain of the same grade. As the car is unloaded and the grain conveyed through the terminal to its proper position by means of a wide conveyor belt, a device called an automatic sampler consisting of metal cups attached to a chain belt, continually dips into the stream and secures an average or unload sample. A Government weighman located at each terminal weighs the grain and issues a certificate showing the weight of each car unloaded. The unload sample is then graded by a Government inspector who compares his decision of grade and dockage with that given on original inspection. While the samples drawn in the railway yards are generally very accurate the automatic sampler overcomes the danger of missing any small pockets of grain which might affect the grade of the car. If grain contains a high amount of moisture it is dried at the terminal and all grain is cleaned for the removal of dockage. Only dry and cleaned grain is shipped abroad. When boats are being loaded the grain is again sampled and inspected by Government inspectors who issue final certificates of grade covering each shipment.

Grading to a large extent is based on the physical appearance of the grain. Color, indicating the degree of ripeness, the extent of green or damaged kernels, the presence of different varieties of grain, etc., are to name but a few of the many considerations involved. Years of training enables the inspector to quickly appraise the type and extent of damage, and on these factors he determines the grade. Grades and combinations of grades of all types of grain, amount to several hundred in number. Dockage and foreign matter are assessed by mechanical means as is the moisture content of each car. Grain companies employ their own representatives to ensure that the highest possible grade is obtained for their own cars and for cars they handle for farmers. If dissatisfied with the original grade or dockage the company representative calls for re-inspection of the unload sample, which he hopes will be a better sample than the original.

If re-inspection is unsuccessful and the original grade is upheld, the unload sample taken by the terminal automatic sampler may be submitted to a Grain Appeal Board, these being located at Winnipeg, Calgary and Edmonton. Each Appeal Board is presided over by a government appointed chairman who is a senior grain inspector and members who represent both producers' organizations and line elevator companies. All members are appointed by the Board of Grain Commissioners and are qualified grain experts. Without any knowledge of the ownership of the car or of its previous grade, it is the duty of the Board to assign the final grade and dockage to the unload sample of each car presented for appeal. The Appeal Board's decision as to the correct grade and dockage is final and the shipment must be paid for on that basis.

### CANADA'S STORAGE CAPACITY

The harvest and handling of Canada's grain crop requires a tremendous volume of equipment and facilities. Farm machinery, trucks, railway equipment and elevator facilities, represent an investment of hundreds of millions of dollars. Scattered at country points across the prairies there are 5,463 elevators which have a capacity of 193,643,000 bushels. Terminal elevators at Fort William and Port Arthur provide storage for 90,152,210 bushels while the Pacific ports have a capacity of 21,724,000 bushels. During the war years country elevator's and lakehead terminal's capacity was increased by building wooden annexes (now mostly



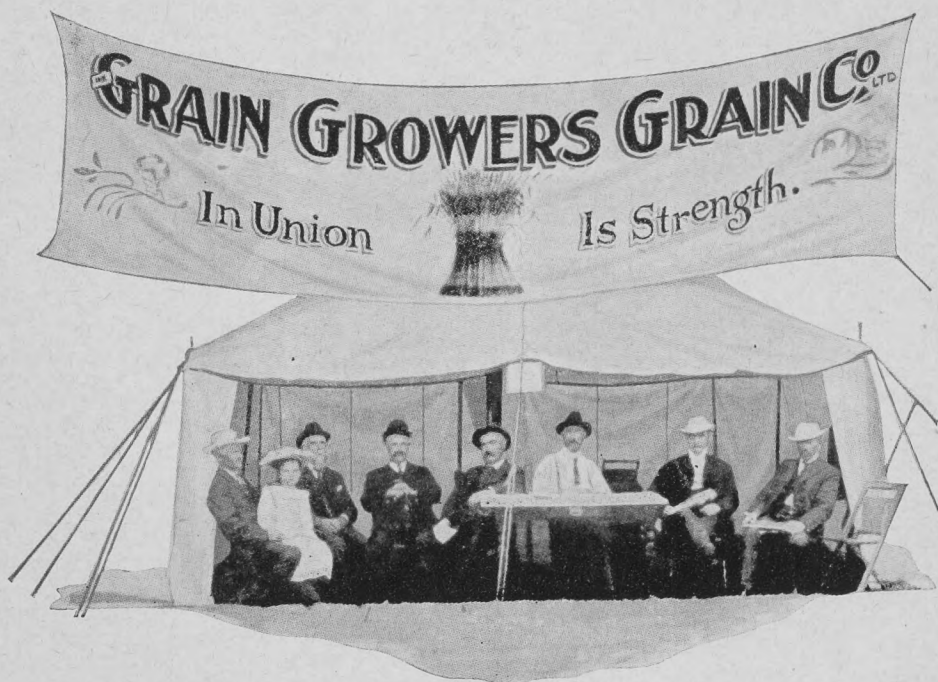


*The grain boat—loading up ready for the overseas market.*

## A WHEAT STUDY FOR JUNIORS

demolished) to provide temporary storage for an additional 163,000,000 bushels. The Canadian wheat crop under normal conditions averages about 330,000,000 bushels annually. During the war years, however, in 1942, a record crop of 556,000,000 bushels of wheat and nearly a billion bushels of coarse grains was harvested. At the peak, Canada's storage capacity exceeded 600,000,000 bushels; while grain shipments, mostly to the ravished countries of Europe, averaged a million bushels a day throughout 1945-46.

Perhaps the most remarkable feature connected with the handling of Canadian grain is the co-ordination of all the services brought into use. Commencing with the threshers and truckmen on the farms, the country elevators, the railroads and terminals all engaged in the physical handling; coupled with the Canadian Wheat Board, the Winnipeg Grain Exchange, the services of the Government inspection and weighing staffs, the banks who finance the grain companies and farmer co-operatives; all operating with such efficiency that Canada's grain marketing system is unexcelled by any country in the world.



*Birth of Grain Growers' Grain Company—the First Farmers' Company—in a Tent at the Winnipeg Exhibition in 1906, when Provisional Directors were Elected.*

Left to right: H. O. AYEART (and daughter); W. H. BEWELL; JOHN SPENCER; JOHN KENNEDY; E. A. PARTRIDGE; DAVID RAILTON; T. W. KNOWLES.

*All students should read the inspiring story of UNITED GRAIN GROWERS LIMITED contained in the following pages.*





*"Elevator Row" at Dawson Creek.*

## THE STORY OF UNITED GRAIN GROWERS LIMITED

*Life in England in 1844 was very discouraging to the working class. Hours were long and wages miserably low. At Rochdale, near Manchester, twenty-eight workers from the nearby weaving mills, decided one day to improve their wretched conditions by opening a co-operative store. "We will sell our goods at retail price, pay a modest rate of interest on invested capital and divide the earnings according to the amount each of us spends in the store." Thus, with a plank set on barrels for a counter, the Rochdale Pioneers opened their tiny business. In doing so they laid the foundation for the co-operative movement, which in a hundred years was to encircle the globe as a means for millions of people to solve their practical problems of everyday living. . . . (Continued on next page).*

## THE STORY OF UNITED GRAIN GROWERS LIMITED •

Founded on the self-same principles of the world-famed Rochdale Pioneers, the story of United Grain Growers Limited is indeed an impressive one. Its early struggle for existence . . . the determination of its founders to improve agricultural conditions . . . their faith in the farmer's ability to operate his own business, involved principles which at the outset were to capture the imagination and confidence of the farm movement of Western Canada. Truly can it be said that the U.G.G. blazed the trail of co-operation in agriculture and like the Rochdale Pioneers, created a pattern on which all other co-operatives in Western Canada were later to be developed.

The formation and development of United Grain Growers Limited is a story closely interwoven with the history and expansion of farming in the prairie provinces. Immigration to Western Canada began about 1870, reaching a peak between 1890 and 1910. Large areas of new land were brought under cultivation and railway lines were extended to keep pace with the rapid influx of settlers. The production of grain increased by leaps and bounds.

Production soon far exceeded local requirements and the difficulty of obtaining transportation and facilities to handle the surplus harvest presented a major problem. The railways would not accept the risk of providing elevators at country points and denied the requests of farmers to construct loading platforms. As a result, country elevators were built and operated by private grain companies. The railways in return made an agreement to provide cars ONLY to the grain companies for the shipment of grain.

A monopoly in grain handling was thus established for the grain companies and they were quick to take advantage of it. After driving long distances—in some cases up to forty miles—to the sparsely scattered elevators, farmers were completely at the mercy of the elevator companies with no recourse against the treatment they received. Under this monopoly the evils of under-grading, excessive dockage deductions and short weighing grew and marketing conditions became intolerable for the farmer. Naturally these conditions caused widespread resentment. A Royal Commission was appointed to investigate the whole situation and finally, certain measures of relief seemed assured with the passing of the Manitoba Grain Act in 1900. Under the Act, the railways were compelled by law to establish loading platforms and to provide cars to farmers for shipping their grain. In addition, the grade and dockage of all grain shipped was to be established by a Government Grain Inspection Department. The advantages thus gained by the farmer, however, were soon offset by the elevator companies. By organizing the Northwest Elevator Association, the elevator companies were in a position to dictate the prices paid for grain. Moreover, the railways continued to ignore the farmers' demands for cars and the situation remained as discouraging for the farmer as it had been prior to the passing of the Manitoba Grain Act.

Realizing that only by uniting could their marketing problems be solved, farmers discussed the formation of their own associations. In 1905, Mr. E. A. Partridge, of Sentaluta, Saskatchewan, recommended that farmers organize their own grain handling business and was appointed to head a committee to investigate the practicability of his proposal. The record reveals that: "The first tangible step toward the organization of a farmer-owned Company occurred at Sentaluta, a little town in Saskatchewan, 304 miles west of Winnipeg, following a mass meeting of farmers held in the Orange Hall, January 27, 1906."

Organization was based on a resolution unanimously passed at the Sentaluta meeting which read in part: "That we, the Grain Growers of Sentaluta, Saskatchewan, in mass meeting here assembled, heartily recommend the formation of a Company, wholly composed of farmers, to be known as the Grain Growers Grain

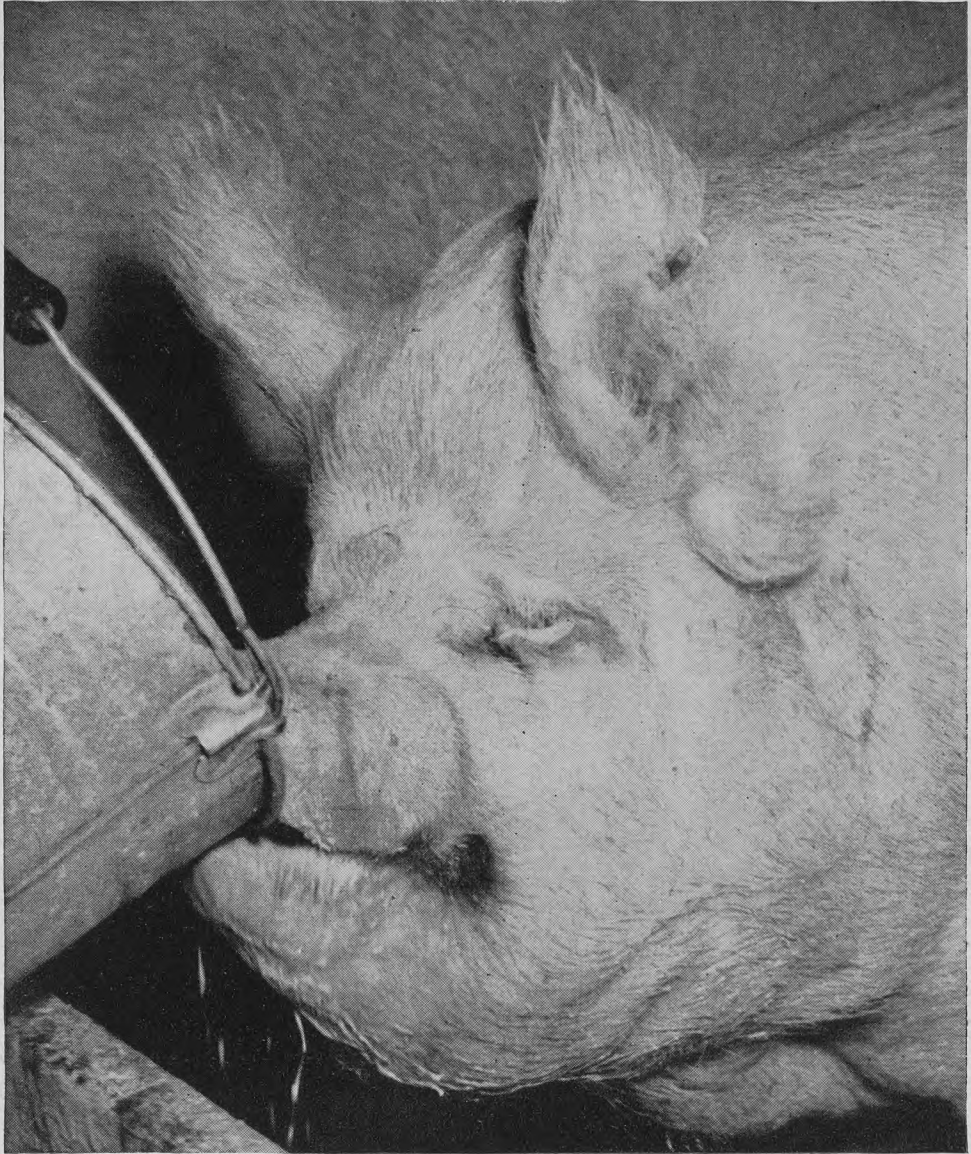




*"They look good to me"—but only the test will tell.*

Company, with shares at \$25.00 each and with a large enough issue of shares to include all western grain growers desirous of becoming members." Thus was launched Canada's first farmer-owned co-operative. The Grain Growers Grain Company (later United Grain Growers Limited) formally opened its doors for business on September 5, 1906, at Winnipeg, the first car of grain being received on September 21.

Meeting strong opposition during the first two years of its operation, the new company faced seemingly insurmountable difficulties. Expelled from the Winnipeg Grain Exchange for declaring its intention of paying patronage dividends in accordance with basic co-operative principles, the Company had no prospect of selling hundreds of cars of grain en route. The bank was demanding payment



*The Junior Swine Club champion enjoys a tasty lunch.*

of an overdraft of \$356,000.00. Finally, disaster was averted when Provincial Premier Roblin of Manitoba arranged for re-instatement in the Grain Exchange. Farmer Directors of the Company pledged their personal assets to the bank and thereby enabled the struggling business to carry on. Confidence and loyalty of the farmers in their own organization rapidly expanded the Company's operations. The monopoly of grain handling had come to an end.

To provide a means of dealing with farm problems and presenting the views of organized farmers, "The Country Guide" began publication in 1908, under the



## THE STORY OF UNITED GRAIN GROWERS LIMITED

name "The Grain Growers' Guide." It was the first subsidiary of the farmers' new Company. Today, "The Country Guide" is one of the largest rural monthly journals in the British Commonwealth. In 1909 an office was opened in Calgary to render quicker service to Alberta farmers. A Traffic Department recovered losses through leaking cars for the farmer from the railway companies. An Inspection Department with a competent inspector constantly checking the Government Grain Inspector's grades, assured farmers receiving the highest grade and correct dockage for the grain.

The Company early learned that at times, and under certain circumstances, better prices for farmers could be obtained by selling direct to millers in Great Britain than by selling on the Grain Exchange. Thus in 1911 a subsidiary Company (Grain Growers Export Company) was formed to conduct an export business. During the next two years, in addition to elevators previously built and 174 obtained by lease from the Manitoba Government, the Company acquired terminal elevators at Fort William and New Westminster, providing additional facilities for the pioneering and ever expanding farmer-owned co-operative.

Encouraged by the success of the Grain Growers Company, farmers in Saskatchewan organized the Saskatchewan Co-operative Elevator Company in 1911. The same year Alberta farmers laid plans for the Alberta Farmers Co-operative Elevator Company, and, in 1913 it commenced to operate. To help the Alberta company to become firmly established, the Grain Growers Grain Company, acting as its business guardian, sold its grain on the Winnipeg Grain Exchange and guaranteed its financing. In 1917 efforts were made to amalgamate the three farmers' companies, and, in the fall of that year, amalgamation of the Grain Growers Grain Company and Alberta Farmers Co-operative was completed, under the name of United Grain Growers Limited. The Saskatchewan Co-operative however, decided to remain a separate entity. The new Company retained headquarters in Winnipeg to operate Manitoba and Saskatchewan business with a Calgary office to control operations in Alberta—to be known as the Western Division.

The "Organized Farmer in Business" . . . as the Company had come to be known, next turned attention to the excessive prices charged for many farm requirements. Establishing a Farm Supplies Department, the U.G.G. Ltd., entered the farm implement and binder twine field in 1914 and in the first year of operation, savings estimated at \$50,000.00 in twine alone, were passed on to the farmers. The Company engaged in the livestock business, lumber milling and insurance business successively and down through the years United Grain Growers Securities Limited has paid insurance claims of nearly five million dollars to western farmers. Today approximately 1,000 agents representing some of the world's largest companies, place a vast amount of insurance annually through U.G.G. Securities Limited.

With the disbandment in 1919 of the Government Wheat Board which had replaced trading on the Winnipeg Grain Exchange during World War I, there were varied opinions voiced for the establishment of a satisfactory marketing agency for Canadian wheat. Many farmers favored a system of co-operative marketing owned and controlled by farmers or by farmer-owned organizations. United Grain Growers Limited, anxious to promote the farmers' interests, worked out a plan for an inter-provincial wheat pool which provided for an average price based on the net pooled receipts from the sale of all grain for the year.

The U.G.G. Limited plan for the pooling of grain, while not strictly adhered to in actual practice, was at least a basis of exploring the possibilities of a system of pooling. In 1923 and 1924 when pools were formed in each western province,

## THE STORY OF UNITED GRAIN GROWERS LIMITED •

United Grain Growers Limited advanced \$25,000.00 for organization expenses. Moreover, it placed its elevator facilities at the disposal of the pools and handled pool wheat at cost for the Alberta and Saskatchewan Wheat Pools. In 1925 as the Pools became established, consideration was given to amalgamation of United Grain Growers Limited with the provincial Wheat Pools. Several proposals were discussed but a basis of operation satisfactory to all, could not be reached and finally negotiations were broken off. Since then competition between United Grain Growers Limited and Pool elevators has become an established and accepted fact. Relations between the organizations have remained amicable, each being primarily concerned with improving conditions for the farmer.

During the thirties, the Company continued to serve the cause of western agriculture in many ways despite the effects of a world wide depression. In 1940 the Company played an active part in opposing the plan of the railway companies for abandoning certain branch lines. Had the plan succeeded, it would have deprived many farmers of rail transportation, and, in some localities, whole communities would have been isolated. In 1943 the Company built a modern plant at Edmonton which manufactures a complete line of Money-Maker livestock and poultry feeds. A second plant at Edmonton specializes in marketing seed grain, the manufacture of rye flour and other products.

The U.G.G. won further acclaim in 1946 when it was authorized to pay its members and customers \$2,500,000.00 in cash as a patronage saving return—commonly called a patronage dividend. For six years the Company had fought consistently for equality of treatment in the application of income tax to co-operatives. While the issue was being decided by the Dominion Government, the Company allocated and held in reserve each year certain money until the sum of two and a half million dollars was available and payment approved by the Government to Western farmers . . . a fitting observance of the Company's fortieth anniversary. For over 40 years, the Company had played a leading role in Canadian agriculture. By the co-operation and loyal support of its tens of thousands of shareholders . . . it had weathered all storms.

Today, rich in experience, the U.G. is better than ever equipped to serve the needs of western farmers. Its financial position is excellent. It owns and operates 628 country elevators, with terminals at Port Arthur and Vancouver. It owns The Public Press Limited in Winnipeg and has a vast investment in additional property. Over a 40-year period it has handled the enormous total of over a billion bushels of grain (equivalent to the total wheat crop of Canada for a period of between three and four years). Community welfare has benefited with payments exceeding \$5,000,000.00 in property taxes. In addition, a very substantial amount has been paid in Income Tax. Grants of nearly \$400,000.00 have been made to other farm organizations and universities, in the interest of improvement in agricultural conditions. Over its history, United Grain Growers Limited has paid its farmer shareholders, by way of dividends or interest on share capital over \$9,000,000.00, nearly \$6,000,000.00 in excess of the total farmers' investment in the Company—and—the farmer shareholder still owns his shares which have a high market value.

All this was first made possible by the courage, faith and resourcefulness of a small group of farmers. Their ranks have since been swelled by many additional thousands who have given loyal support to the Company. By their united efforts they have succeeded in winning vastly improved methods of marketing and better living standards for all farm families in Western Canada.







**WESTERN CANADA'S  
PIONEER  
FARMER-OWNED  
CO-OPERATIVE**

*Serving Agriculture Since 1906*

